

METHOD AND APPARATUS FOR COOLING COMBUSTOR LINER AND TRANSITION PIECE OF A GAS TURBINE

Abstract

A method and apparatus for cooling a combustor liner and transition piece of a gas turbine include a combustor liner with a plurality of circular ring turbulators arranged in an array axially along a length defining a length of the combustor liner and located on an outer surface thereof; a first flow sleeve surrounding the combustor liner with a first flow annulus therebetween including a plurality of axial channels (C) extending over a portion of an aft end portion of the liner parallel to each other, the cross-sectional area of each channel either constant or varying along the length of the channel, the first flow sleeve having a plurality of rows of cooling holes formed about a circumference of the first flow sleeve for directing cooling air from the compressor discharge into the first flow annulus; a transition piece connected to the combustor liner and adapted to carry hot combustion gases to a stage of the turbine; a second flow sleeve surrounding the transition piece a second plurality of rows of cooling apertures for di-

recting cooling air into a second flow annulus between the second flow sleeve and the transition piece; wherein the first plurality of cooling holes and second plurality of cooling apertures are each configured with an effective area to distribute less than 50% of compressor discharge air to the first flow sleeve and mix with cooling air from the second flow annulus.